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Brook Snaketail Dragonfly

Ophiogomphus aspersus

State Status: **Special Concern**
Federal Status: None

DESCRIPTION: The Brook Snaketail (*Ophiogomphus aspersus*) is a large insect of the order Odonata and suborder Anisoptera (the dragonflies). The Brook Snaketail is a member the family of dragonflies known as the clubtails (Gomphidae), which are characterized by a club-like swelling near the tip of the abdomen. Members of the genus *Ophiogomphus* (the snaketails), which includes the Brook Snaketail, are characterized by their brilliant green thorax, eyes and face. The swelling in the abdomen of the Brook Snaketail forms a club that is over half the width of the thorax. Although the exact purpose of this swelling is not known, it might be used in courtship displays or to improve aerodynamics in flight. Each segment of the black abdomen is marked dorsally with a rearward-pointing, dagger-shaped, yellow marking. In addition, the sides of segments seven, eight and nine are marked with large yellow markings, accenting the "club." The wings are clear, supported by a dense network of black veins. Brook Snaketails perch horizontally on rocks, logs, vegetation or the ground with their wings held horizontally, like those of an airplane.

Adult Brook Snaketails range from about 1.7 to 1.8 inches (44 to 46 mm) in length. Although both sexes are similar in coloration, the female is larger and has a much reduced "club" at the tip of her abdomen.

SIMILAR SPECIES: The snaketails are easily distinguished from the other clubtails of Massachusetts by their brilliant green thorax, eyes, and face. However, within the genus, the species are very similar in appearance. Five species of *Ophiogomphus* have been recorded in Massachusetts. All of these are similar in coloration, size and shape. The shape and size of the dorsal abdominal markings differ between species and may help to identify the various species of *Ophiogomphus*. However, these markings can be variable and should be used in combination with other factors to definitively identify these species. In males, the most reliable way to identify the various species of snaketails is by characters of the terminal abdominal appendages and hamules (as shown in Walker (1958) and Needham *et al.* (2000)). The shape of the vulvar lamina of the females is the best way to differentiate individuals of that sex from each other (as shown in Walker (1958) and Needham *et al*. (2000)). The nymphs can be distinguished by characteristics of the dorsal spines on the abdomen and characteristics of the antennae as reported in keys by Walker (1958) and Soltesz (1996).

HABITAT: Brook Snaketails can be found in clear, sand-bottomed streams with intermittent rapids, often flowing through dense woodland.

LIFE-HISTORY/BEHAVIOR: The flight season of the Brook Snaketail begins in late May when the adults emerge from the streams. This species has a long flight season, with adults having been observed through late August. Little has been published on the life cycle of the Brook Snaketail. However, published information on the life cycles of similar species are most likely applicable and help supplement the data known for the Brook Snaketail. Both dragonflies and damselflies have two distinct life stages following hatching of the egg: an aquatic larval stage (nymph) and the flying adult stage. Most dragonfly nymphs are wholly aquatic, only venturing out of the water to emerge into the adult form.

Brook Snaketail nymphs spend the bulk of their time burrowing in the sand. The habit of burrowing not only provides them with protection from predators, but may also provide them with camouflage or a hiding spot from which they can capture prey. Nymphs have a hinged labium (lower lip). This structure is used by the nymph to capture prey. Most dragonfly nymphs hunt by using an ambush technique. They sit motionless for long periods

BROOK SNAKETAIL FLIGHT PERIOD

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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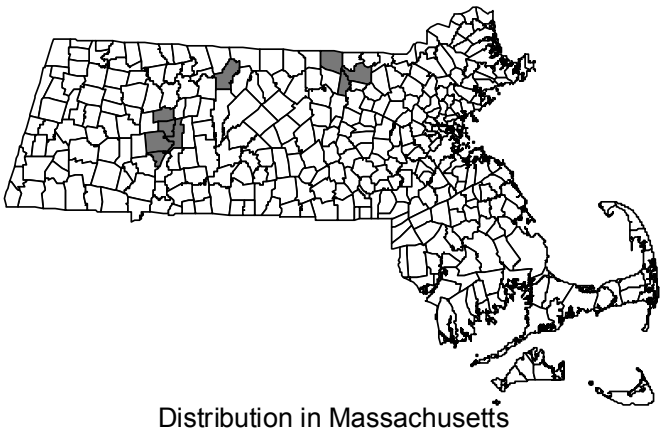
of time. Dragonfly nymphs are voracious predators and feed on a variety of aquatic life from insects to small fish and tadpoles.

The duration of complete larval development in the Brook Snaketail is not known. However, for similarly sized dragonflies, the process takes about a year. Eclosure takes place only when the nymph is fully developed and involves the emergence of the adult dragonfly from its larval exoskeleton. The nymph of the Brook Snaketail usually crawls up directly onto the bank of the stream to emerge, though it may also utilize rocks or logs jutting out of the water and even bridge abutments. Upon finding a secure perch, usually less than a foot above the water's surface, the adult pushes out of the nymphal exoskeleton (the exuviae) and stretches its wings. The new adult (a teneral) is very soft and vulnerable at this time. In the first few hours following emergence, adults can be damaged by rain showers, falling debris, or predators. For this reason, the adult makes its maiden flight into the woods that surround the breeding habitat, as soon as possible. Away from the water, the dragonfly can find relatively safe shelter among the leaves and branches of trees. During this time of wandering and maturation, adult dragonflies can also be found in fields and in forest clearings, sometimes far away form the breeding site, feeding on small aerial insects such as flies and mosquitoes. When the maturation process is complete, which takes about a week, the adults return to the stream to breed. In Massachusetts, the Brook Snaketail probably breeds from early June through late August. Upon returning to the stream, male Brook Snaketails set up patrols regularly flying out over the water and along the stream bank. In between patrols, the males may be found perched on the bank of the stream, exposed rocks or logs, and streamside vegetation. The main purpose of these patrols is the search for potential mates and to drive out competing males. Females spend little time around the breeding habitat, except during the brief time when they are ready to mate and lay eggs.

When a female is found, the male Brook Snaketail will grab her in back of her eyes with his terminal abdominal appendages. A receptive female will position the tip of her abdomen, where her reproductive organs are located, at the hamules of the males, which are on the underside of his second segment. This is known as the "wheel position", with the male on top and the female below. The joined pair will usually fly up into the surrounding forest, most often into the very tops of the trees, where mating occurs.

Mating may take less than one minute to over an hour depending on the species. It is not known how long it takes in the Brook Snaketail. When mating is completed, the female returns to the water in order to lay her eggs. Female Brook Snaketails oviposit alone by tapping the tip of their abdomen to the surface of the water. This is usually done around a riffle in the stream as she flies rapidly back and forth over the water.

RANGE: The Brook Snaketail occurs from Nova Scotia west to Quebec and Michigan, south to North Carolina, Kentucky and Iowa. It has been found in all six New England states.



Distribution in Massachusetts
1977 - 2002
Based on records in Natural Heritage Database

POPULATION STATUS IN MASSACHUSETTS: The Brook Snaketail is listed as a Species of Special Concern in Massachusetts. As with all species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing, etc…) and sale under the Massachusetts Endangered Species Act. The Brook Snaketail has not been found in large numbers in Massachusetts. Due to apparently low population densities and its limited distribution in Massachusetts, the Brook Snaketail should be carefully watched.

MANAGEMENT RECOMMENDATIONS: As for many rare species, the exact management needs of the Brook Snaketail are not known. Alteration of water quality is certainly a threat to the maintenance of their populations in Massachusetts. Threats to water quality include industrial pollution, littering, and salts and other run-off from roadways. Also, as an inhabitant of fast-flowing streams, this species may also be particularly vulnerable to alterations in flow of the streams by damming or water diversion projects. The upland borders of these river systems are also crucial to the well-being of odonate populations as they are critical for feeding, resting, and maturation. Development of these areas should be discouraged and preservation of the remaining undeveloped upland bordering the river should be a top priority.

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